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EXAMINER
KANG, INSUN

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/813,867	NORTH, GERAINT
	Examiner	Art Unit	
	Insun Kang	2193	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *1/17/2006, 7/28/2004, and 3/30/2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>30 March 2004</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some *   c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/17/2006 and 7/28/2004*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1. This action is responding to application papers filed on 1/17/2006, 7/28/2004, and

    3/30/2004.

2. Claims 1-51 are pending in the application.

Drawings

3.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because

they do not include the following reference sign(s) mentioned in the description: "131" in

paragraph 0167 of page 15.

4.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because

they include the following reference character(s) not mentioned in the description: 16 and

18 in Fig. 1. 181,183,185,187, 189, 191, 193, and 165 in Fig. 2. 1209 in Fig. 8. 211 in

Fig. 16.

5.   Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to

the specification to add the reference character(s) in the description in compliance with

37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the

application. Any amended replacement drawing sheet should include all of the figures

appearing on the immediate prior version of the sheet, even if only one figure is being

amended. Each drawing sheet submitted after the filing date of an application must be

labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37

CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be

notified and informed of any required corrective action in the next Office action. The

objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7.   Claim 49 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 49 is non-statutory because it is directed to program code without recitation of a computer or a computer-storage medium embodying the recited code. The claim merely recites "In combination" of program code that is disembodied arrangement so as to be called a "computer program" or compilation of facts, information, or data *per se*, without creating any functional interrelationship, either as part of the stored data or as part of the computing processes performed by the computer ("acts") or computer readable medium so as to enable the computer to perform the claimed code.   Thus the claim represents non-functional descriptive material that is not capable of producing a useful result, and hence represents only abstract ideas. Therefore, the claim is non-statutory.

The following link on the World Wide Web is for the United States Patent And Trademark Office (USPTO) policy on 35 U.S.C. §101. The following link on the World Wide Web is for the United States Patent And Trademark Office (USPTO) policy on 35 U.S.C. §101.

<http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026. pdf>

Claim Rejections - 35 USC § 112

8.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

9.   Claims 1-51 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention.

Per claims 1, 17, 33, and 49:

It is unclear as to which subject code in claim 1 (line 5), claim 17 (line 9), claim

33 (line 7), and claim 49 (line 6) it is referring. It is interpreted as: the subject code. It is

also unclear as to which target code in claim 1 (lines 3-5), claim 17 (lines 7-9), claim 33

(lines 5-7), and claim 49 (lines 4 and 6). It is interpreted as: the target code. Further, in

claims 17 and 33, it is unclear whether the subject program code in claim 17 (line 3) and

claim 33 (line 2) and subject code in claim 17 (line 6) and claim 33 (line 4) are the same

code. Interpretation: the subject code is "the subject program code." Furthermore, per

claim 49, it is unclear what combination it is referring because there is only program code

in the claim.

Per claims 2, 18, and 34:

The phrase "compatibility of cache translations and subject code to be translated"

is unclear in meaning and is interpreted as: compatibility of the cached portion of the

target code and the second portion of the subject code to be translated.

Claims 3, 19, and 35 recite the limitation "the byte sequence" in line 1. There is

insufficient antecedent basis for this limitation in the claim.

Per claims 5 and 37:

It is unclear to which code the cache key is directed. Interpretation: (1) filename of executable as: "the name of the file containing the subject code."(2) offset and length of the subject code sequence as: "the offset and length of the subject code sequence within the file containing the subject code." (3) last modification time of file as: "the last modification time of the file containing the subject code." (4) version number of the translator as: "the version number of the translator that translated the first portion of the subject code into the portion of the target code." (5) subject memory address of subject code sequence as: "the address in subject memory where the subject code was loaded."

Per claim 21:

It is unclear to which portion of subject code in line 2 it is referring. Interpretation: the first portion of the subject code. Further Interpretation: for the limitations (2)-(5) in the claim are interpreted as same as in claims 5 and 37.

Per claims 7, 23, and 39:

It is unclear as to which compatibility it is referring. Interpretation: the compatibility.

Per claim 38:

Claim 38 recites the limitation "the cache key" in line 1. There is insufficient antecedent basis for this limitation in the claim. It is unclear whether the claim is intended to be dependent on claim 34 in connection with claims 7 and 23. Interpretation: claim 38 depends on claim 34.

Per claim 50:

It is unclear as to which subject code it is referring. Interpretation: the subject code.

As per claims 4, 6, 8-16, 20, 22, 24-32, 36, 40-48, and 51, these claims are

rejected for dependency on the above rejected parent claims.

Claim Rejections - 35 USC § 102

10.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11.   Claims 1-4, 6-9, 11, 13-15, 17-20, 22-25, 27, 29-31, 33-36, 38-41, 43, 45-47, and

49 are rejected under 35 U.S.C. 102(e) as being anticipated by Babaian et al. (US Patent

6,820,255) hereafter Babaian.

Per claim 1:

Babaian discloses:

- translating a first portion of subject code into a portion of target code; (i.e.

  "first translate foreign binary code to equivalent host code," col. 5 lines 17-24;

  "where the foreign code sequence...is the code ...or a portion of the

  code...that was previously translated," col. 9 lines 25-35)

- caching said portion of target code (i.e. "the cache of host code," col. 3 lines

  26-43; see Fig. 4 which shows the database cache for minimizing the need to

  translate foreign code at run-time; col. 4 lines 12-15)

- and retrieving the cached portion of target code upon compatibility detection

  between said portion of target code and a second portion of subject code (i.e.

  "compares at least a portion of the foreign code sequence…with a portion of

  the foreign code stored in database…associated with the binary translated

  code…loads the binary translated code," col. 8 lines 37-48; col. 9 lines 23-35).

Per claim 2:

Babaian further discloses:

- wherein compatibility of cache translations and subject code to be translated is

  determined by cache key comparison (i.e. "recognizing the foreign code uses

  hash coding for determining an associative location in database…to identify

  the location in database where corresponding translated binary code is stored,"

  col. 10 lines 47-55; "After the hash value and entry point address into the

  database is determined," col. 11 lines 59-64).

Per claim 3:

Babaian further discloses:

- wherein the cache key is the byte sequence that encodes the corresponding

  subject code instruction sequence (i.e. "determining an associative location in

  database," col. 10 lines 47-55).

Per claim 4:

Babaian further discloses:

- wherein the cache key is a hash of the corresponding subject code instruction sequence (i.e. "After the hash value and entry point address into the database is determined," col. 11 lines 59-64).

Per claim 6:

Babaian further discloses:

- wherein the cache key comprises a plurality of metrics (i.e. i.e. provide it with profile information," col. 6 lines 59-67 which includes a plurality of metrics such as pc, counters, timers, call stack etc).

Per claim 7:

Babaian further discloses:

- wherein compatibility is determined by computing a cache key data structure corresponding to the subject code to be translated to a plurality of second data structures, each second data structure corresponding to a different set of cached target code instructions (i.e. "recognizing the foreign code uses hash coding for determining an associative location in database...to identify the location in database where corresponding translated binary code is stored," col. 10 lines 47-55).

Per claim 8:

Babaian further discloses:

- including the step of executing the target code (i.e. "the binary translated

   image of the foreign code will be available for execution by the host

   processor…as the translated binary code executes," col. 6 lines 28-42).

Per claim 9:

Babaian further discloses:

- wherein translations of self-modifying code are not cached (i.e. "self-

   modifying code…may not be discovered at binary translation time…is

   saved…by the optimizing binary translation process 202," which is saved in

   118 and not cached in code database 208, col. 7 lines 1-8; Fig. 2).

Per claim 11:

Babaian further discloses:

- wherein the portion of target code cached comprises one or more block

   translations and their respective successor lists (i.e. "If an indirect jump is

   detected, the process flow proceeds back to step 302," which branches to the

   next instruction address locations, col. 8 lines 54-58; Fig. 3).

Per claim 13:

Babaian further discloses:

- wherein the portion of target code cached consists of a single instruction (i.e.

   "the corresponding host code stored in code database 208," col. 7 lines 45-53).

Per claim 14:

Babaian further discloses:

- wherein the portion of target code cached comprises all code blocks corresponding to the same starting subject address (i.e. "hot spots in the foreign code," col. 12 lines 60-67).

Per claim 15:

Babaian further discloses:

- wherein the portion of target code cached comprises a cache unit representing a discrete range of subject addresses (i.e. i.e. "using the disk sector as an address or index into the database…a block of translated binary code at the address," the address space defines a range of discrete addresses, col. 10 lines
  - 26-40).

Per claims 17-20, 22-25, 27, and 29-31, they are the combination versions of claims 1-4, 6-9, 11, and 13-15, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-4, 6-9, 11, and 13-15 above.

Per claims 33-36, 38-41, 43, and 45-47, they are the medium versions of claims - 1-4, 6-9, 11, and 13-15, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-4, 6-9, 11, and 13-15 above.

Per claim 49, it is the combination version of claim 1, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 1 above.

Claim Rejections - 35 USC § 103

12.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

13.   Claims 5, 21, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Babaian et al. (US Patent 6,820,255) hereafter Babaian, in view of Curtis et al. (US

Patent 6,826,750) hereafter Curtis, and further in view of Ronstrom (US patent

6,249,788).

Per claim 5:

Babaian discloses the cache key comprising offset and length of the subject code

sequence (i.e. "the location," col. 10 lines 47-55) and (5) subject memory address of

subject code sequence (i.e. "address is marked," col. 10 lines 25-40).

Babaian does not explicitly disclose the key comprising a version number of the

translator. However, Curtis teaches using a version number as a key was known in the

pertinent art, at the time applicant's invention was made, to identify a specific file or a

portion of the file (i.e. "The key would be the version number plus the file name," col. 8

lines 59-60). It would have been obvious for one having ordinary skill in the art to

modify Babaian's disclosed system to incorporate the teachings of Curtis by adding the

translator's version number in the cache key. The modification would be obvious

because one having ordinary skill in the art would be motivated to identify a file or a

portion of the file faster.

Babaian and Curtis do not explicitly teach the key comprising a filename of

executable and last modification time of file. However, Ronstrom teaches using a

filename and timestamp as a key was known in the pertinent art, at the time applicant's

invention was made, to identify a specific file (i.e. "file name, time stamps…are

examples of keys stored in a B-tree," col. 1 lines 59-60). It would have been obvious for

one having ordinary skill in the art to modify the system of Babaian and Curtis to

incorporate the teachings of Ronstrom. The modification would be obvious because one

having ordinary skill in the art would be motivated to identify a file or a portion of the

file faster.

Per claim 21, it is the combination version of claim 5, respectively, and is rejected

for the same reasons set forth in connection with the rejection of claim 5 above.

Per claim 37, it is the medium version of claim 5, respectively, and is rejected for

the same reasons set forth in connection with the rejection of claim 5 above.

14.   Claims 10, 26, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Babaian et al. (US Patent 6,820,255) hereafter Babaian in view of Miller ("Software

Based Instruction Caching for the RAW Architecture," 5/1999).

Per claim 10:

Babaian further discloses the translation structure as a block (portion, sequence)

(i.e. col. 10 lines 25-35; col. 3 lines 26-35; col. 9 lines 25-35) and dynamic binary

translation (i.e. "Dynamic binary translator," col. 7 lines 9-18), which translates a simple

sequence of code usually on the order of single basic block and caches the resulting

sequence. Babaian does not explicitly teach that the block is indeed a basic block unit.

However, Miller teaches using a basic block for a cache block was well known in the

pertinent art, at the time applicant's invention was made, to ensure that "all instructions

which are loaded" are executed and keep "track of entry points by keeping track of

blocks (i.e. page 16, section 2.1.1 Basic Block, second paragraph)." It would have been

obvious for one having ordinary skill in the art to modify Babaian's disclosed system to

incorporate the teachings of Miller. The modification would be obvious because one

having ordinary skill in the art would be motivated to minimize wasting of the cache

space and simplify bookkeeping suggested by Miller (i.e. page 16, section 2.1.1 Basic

Block, second paragraph).

Per claim 26, it is the combination version of claim 10, respectively, and is

rejected for the same reasons set forth in connection with the rejection of claim 10 above.

Per claim 42, it is the medium version of claim 10, respectively, and is rejected

for the same reasons set forth in connection with the rejection of claim 10 above.

15.   Claims 12, 16, 28, 32, 44, and 48 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Babaian et al. (US Patent 6,820,255) hereafter Babaian in view of

Nelson et al. (US Patent 5,475,840) hereafter Nelson.

        Per claim 12:

Babaian teaches converting a protion of target code into a single cache unit

comprisng a subject program (col. 8 lines 37-48; col. 9 lines 23-35). Babaian does not

explicitly teach the cache comprising all its associated libaries. However, Nelson teaches

caching a program and its associated libraries was known in the pertinent art, at the time

applicant's invention was made, to minimize the "time delay in program start-up (i.e. col.

3 lines 15-21)." It would have been obvious for one having ordinary skill in the art to

modify Babaian's disclosed system to incorporate the teachings of Nelson. The

modification would be obvious because one having ordinary skill in the art would be

motivated to minimize "the linking overhead (i.e. col. 2 lines 55-62)" as suggested by

Nelson.

Per claim 16:

Babaian teaches the protion of target code cached comprisng a subject program

(col. 8 lines 37-48; col. 9 lines 23-35). Babaian does not explicitly teach the cached

portion comprising a subject libary. However, Nelson teaches caching a library was

known in the pertinent art, at the time applicant's invention was made, to minimize the

"time delay in program start-up (i.e. col. 3 lines 15-21)." It would have been obvious for

one having ordinary skill in the art to modify Babaian's disclosed system to incorporate

the teachings of Nelson. The modification would be obvious because one having

ordinary skill in the art would be motivated to minimize "the linking overhead (i.e. col. 2

lines 55-62)" as suggested by Nelson.

Per claims 28 and 32, they are the combination versions of claims 12 and 16,

respectively, and are rejected for the same reasons set forth in connection with the

rejection of claims 12 and 16 above.

Per claims 44 and 48, they are the medium versions of claims 12 and 16,

respectively, and are rejected for the same reasons set forth in connection with the

rejection of claims 12 and 16 above.

16.   Claims 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Babaian et al. (US Patent 6,820,255) hereafter Babaian.

Per claim 50:

Babaian discloses the first and second portion of subject code in Fig 5. Babaian

does not explicitly teach that the first portion of subject code is part of a first program and

the second portion of subject code is part of a second program. However, it would have

been obvious for one having ordinary skill in the pertinent art to modify Babaian's

disclosed system to compare the translated first portion of the first program with any

other portion or code in another program (any) to see if the other program code or portion

is in the database cache. The modification would be obvious because one having ordinary

skill in the art would be motivated to minimize "the need to translate foreign code at run-

time (col. 4 lines 10-15; col. 3 lines 35-40)."

Per claim 51:

Babaian further discloses:

- said target code is cached at the end of translation of said first program (i.e.

  "translate the foreign code to host code...then added to the database so that it

  may be subsequently accessed should the need arise," col. 3 lines 30-43).

17.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The examiner can normally be reached on M-R 6:30-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MENG AI AN can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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